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First Aid

Hand Book

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"First Aid"
Hand Book:

A Collection of Instructions for
Rendering Effective and
Intelligent First Aid
in Accidents and
Sudden Illness,

—BY—

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Edited by

THOMAS BOUNDY.

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INTRODUCTION.

For twelve years I have practised medicine and surgery in North-eastern Pennsylvania, a region densely inhabited by people engaged in the hazardous occupations of manufacturing, railroading and mining.

Naturally, therefore, I have become very familiar with accidents, many of which have been followed by fatal results, due wholly to lack of prompt and intelligent First Aid.

Railroad accidents often occur several miles from the nearest doctor or the injured man's home, while in mining the matter is worse, the workman being struck down a mile or two underground. So, being in daily contact with this class of accidents, I became interested in First Aid work.

In March, 1900, I organized a class of twenty-five men, all working in one colliery. Each member of the class was furnished with a First Aid packet, and in order that they might acquire some knowledge to supplement what they obtained through a short course of lectures, I had them send to England for twenty-five copies of "First Aid to the Injured," a little book written by the late Surgeon-Major Peter Shepherd and published by the St. John Ambulance Association. This is an excellent manual, but not exactly adapted to our needs in the United States. The present volume is, therefore, written to furnish instruction to First Aid associations in this country. The plan adopted is almost identical with that of the English work, and, as a testimony to the excellence of the same, it may be added that I have quoted largely from it.

But more than this was necessary to produce a book suited to the United States and up to date. In this work, therefore, will be found a chapter on "The First Aid packet;" an article on Electric Shock, a subject becoming more important every year; the United States Army litter drill, by Captain J. E. Pilcher, M.D., U.S.A., has been adapted for First Aid associations to be used by them in exhibitions and contests between their various associations. In addition to these matters there is a chapter on "How to Prepare for Accidents" and an excellent list of "Don'ts" by Dr. H. C. Wheeler, of Carbondale, Pa.

Most of the illustrations in the chapter treating of Anatomy and Physiology were courteously furnished by the J. B. Lippincott Co.

The First Aid Hand Book being intended for use by plain people, I have, as much as possible, avoided technical terms, using only a vocabulary easily understood by those for whose sole benefit the work has been projected.

If this effort of mine becomes the means of advancing in this country the cause of First Aid work—in which, though a progressive people, we are sadly lacking—it will be a boon to many and will bring no small satisfaction to

M. J. Shields, M. D.

Jermyn, Pa., January 1, 1901.

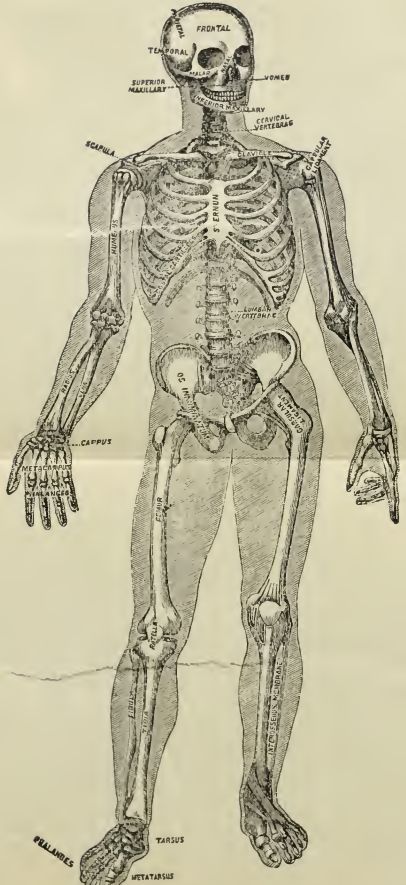

RIETAL
FRONTAL
TEMPORAL
MALAR
NASAL
VOMEB
SUPERIOR MAXILLARY
INFERIOR MAXILLARY
CERVICAL VERTEBRAG
SCAPULA
CLAVICLE
CAPSULAR LIGAMENT
STERNUN
HUMERUS
COSTAL CARTILAGES
LUMBAR VERTEBRAE
OS INNOMINATUM
CAPSULAR LIGAMENT
RADIUS
ULNA
CARPUS
METACARPUS
PHALANGES
FEMUR
PATELLA
FIBULA
TIBIA
INTEROSSEOUS MEMBRANE
TARSUS
PHALANGES
METATARSUS

Fig. 1.

First Aid Hand Book.

CHAPTER I.

ANATOMY AND PHYSIOLOGY.

The Bones.

The framework upon which the human body is built is called the skeleton (Fig. 1), which consists of more than 200 bones. These vary in size and shape according to the work they have to perform, or the important structures they have to protect. For instance, the skull forms a protection for that important organ, the brain, while the ribs and the breastbone form a bony protection for the heart.

The bones also support the weight of the body and the long bones act as levers for the various muscles. The bones consist largely of mineral substances of which lime is an important element The bones of children are soft and may easily be bent. When a fracture occurs in a child the bone usually breaks in the manner of a green stick. This is due to the bone having in its composition more animal substance than mineral.

Bone in adults is more easily broken and in old age becomes exceedingly brittle, so much so that a slight fall may result in the fracture of a limb.

The bones of the skull may be divided into those of the brain-case and those of the face. With the exception of the lower jaw, the bones of the skull are firmly united, forming, as already intimated, a strong case for the protection of the brain, eyes, inner ear and organs of smell. The top of the skull is curved so as to form a resisting surface. Both the top and front of the skull are much thicker than the sides and, consequently, are better able to stand the hard knocks to which they are sometimes subjected. As an extra safeguard the skull consists of two shells. In some accidents the outer shell only is broken, in which case the injury is less serious than if both shells were alike damaged.

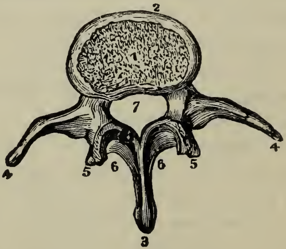


FIG. 2. A VERTEBRA.
1, The cartilage that connects the vertebræ; 3, 4, 5 and 6, projections; 7, opening for spinal cord.

The skull rests on a series of bones called the Spinal Column, extending from the head to the haunch bones. This column is made up of thirty-three bones called Vertebræ.

The twenty-four upper bones have a pad of cartilage between each two, which acts as a cushion. This provision adds to the elasticity of the spine and prevents any possible jarring when we jump or are shaken by any other form of exercise. These bones are kept in place by ligaments, which are very tough. The ligaments are bands which pass up and down and around the Spinal Column to hold the bones firmly together.

There is very little movement between any two bones of the spine; but taken as a whole it is flexible in every direction.

Commencing at the top, the seven upper vertebræ are called the Cervical or Neck vertebræ; the next twelve are the Dorsal or Back vertebræ; the next five are the Lumbar or Loin vertebræ, the remaining nine being called the False vertebræ.

Extending from the top to near the bottom of the spine is a canal which contains and protects the Spinal Cord.

In adults the lower five vertebræ are joined together and form a bone called the Sacrum or Rump bone. This bone is united with the two Pelvic or Haunch bones, and these in turn are united in front forming a strong case or basin called the Pelvis, which protects the bladder and intestines in males, while in females it contains also the generative organs.

The ribs are twenty-four in number, twelve on each side. They are shaped like a half hoop and are connected in the back to the twelve dorsal vertebræ. In front they are attached to the breast-bone, except the last two, which are shorter than the others and their front ends are free.

The breast-bone in front, the ribs on the sides, with the spine in the back form the Thorax, or Chest, which, as previously shown, is a strong cage for the protection of such vital organs as the lungs, heart and the great blood-vessels attached to it. The chest is also strengthened in the upper part of the back by the shoulder-blades, which cover a large section of the upper seven ribs. Attached to these bones are numerous muscles which move the arms.

Between the top of the breast-bone and the shoulders are two curved bones, each shaped somewhat like an elongated S. These are termed the Collar-bones.

The bones of the upper limbs are long and rather thin, as they do not have to support any great weight, but are arranged for freedom of movement.

What is commonly called the arm is by anatomists divided into two parts—the arm, which has only one bone, called the Humerus; and the fore arm, which has two bones, the Radius on the thumb side and the Ulna on the inside. These two bones end at the wrist, which contains eight bones in two rows, all held firmly together by strong ligaments.

In the hand there are, besides the wrist bones, nineteen other bones. Five in the palm are called the Metacarpal bones. Then, each finger has three bones and the thumb two. (See Fig. 1).

The lower limbs are furnished with very strong bones, because they have to support and carry the weight of the body.

On the outer side of each pelvic or haunch bone is a deep cup like depression, into which is inserted the head of the Femur or thigh bone. The thigh, or upper half of the leg, has only this one bone. It is of a peculiar shape, which you will do well to study. Referring again to Fig. 1 you will notice its peculiar, cane-handle shape at the upper end and its round knob that fits in the cup of the haunch bone. This combination of a knob-shaped end with its corresponding socket allows great freedom of motion in walking, running, dancing, etc. The lower end of the thigh bone forms a large expansion to allow a broad base for support at the knee.

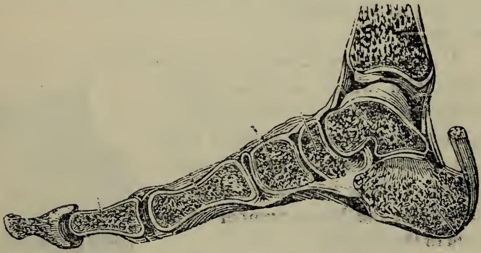


FIG. 3. BONES OF THE FOOT

In the leg (lower part) there are two bones, the Tibia or shin bone, which is on the inside, and the Fibula or small bone on the outer side. The front of the knee is protected by a small bone called the Patella or knee-cap, which also serves as a fulcrum for the muscles of the fore part of the leg. The two bones of the leg end at the foot in the form of an arch, which rests on the heel bones and form the ankle.

Like the hand, the foot contains a large number of bones, not less than twenty-six. They are arranged in the form of two arches crossing each other at right angles, one extending from the heel to the toes, (Fig. 3), and the other from the outer to the inner side of the foot. These bones are all held together by strong bands of fibrous tissue already spoken of as ligaments. The bones of the foot have not much freedom of motion, except those of the toes and they never have as much flexibility as the fingers.

Joints.

When the ends of two or more bones come together they form a joint, which may be what is known as a ball–and–socket joint, as the hip or shoulder, or a hinge joint, as the knee and elbow, or some modification of these two classes of joints, which form the larger number of the joints of the body.

The bones at the joints are usually larger than they are in their middle or shaft. The end is covered with a layer of gristle or cartilage, which serves as a cushion and prevents pain when the joint is in motion. Over this gristle or cartilage is a thin membrane or skin which secretes a fluid, in common parlance called "joint water." Its function is to oil or lubricate the parts so that they will move freely and without friction which would cause

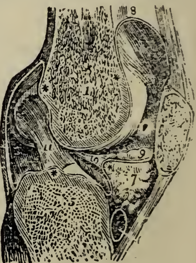


FIG. 4.

pain. At the joints the bones are kept in position by ligaments which surround them on all sides. Figure 4 shows a vertical section of the knee and exhibits very plainly the lower end of the thigh bone, the knee-cap, the upper end of the shin bone and some of the ligaments surrounding the joint.

The Muscles.

The arms and legs and other parts of the body that have motion are moved by muscles, and the more work they have to perform the larger they are. The muscles are masses of red flesh which make up the bulk of the body. They are shaped according to the requirements of their work. In the thigh, leg and arm they are long and have thick bellies or middles. Where they cover cavities they are thin and flat like the abdominal muscles. (See Fig. 6.)

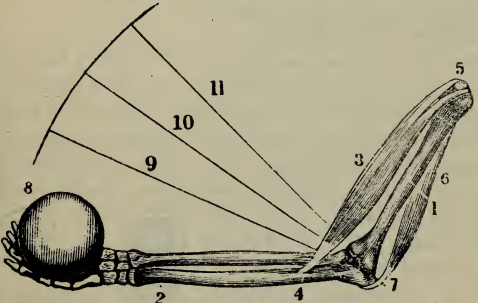


FIG. 5.

The muscles are made up of little bundles of fibres enclosed in a sheath. This sheath ends in a Tendon or cord that is composed of a hard, tough, whitish tissue and is attached to the bones on which it acts. (See Fig. 5.) These tendons are very long in the fore-arm and can be plainly seen in the wrist, which they pass over to be attached to the fingers.

When a muscle is brought into action, one end being fixed, its middle shortens and becomes thicker, thus drawing its free end toward the fixed one.

Circulation of the Blood.

The different parts and organs of the body have to be supplied with food and nourishment for their support and growth. This food is called the blood. Blood is a complex liquid. containing many ingredients, the principal ones being Albumen, Water and Mineral Salts One of the minerals is Iron, which is a very important constituent. In the blood are little cells or discs, which are called blood cells (See Fig. 7.) They cannot be seen by the unaided eye, but through a powerful microscope they are seen to be of two kinds, red and white, the former being more numerous than the latter.

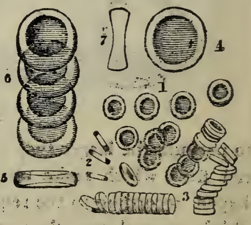


Fig. 7.

BLOOD CELLS, MAGNIFIED.

The blood circulates through tubes called Arteries, Veins and Capillaries Besides supplying nourishment to every part of the body, its mission is to take

FIG 6. THE MUSCLES.

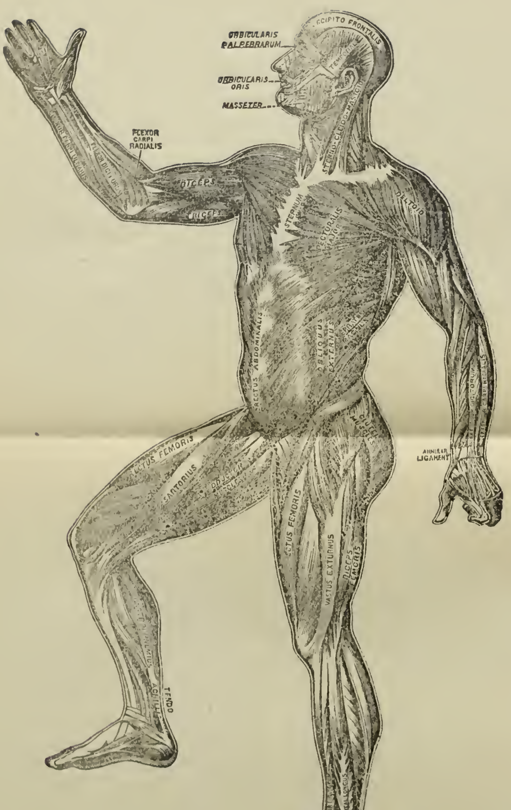


Fig 6. The Muscles.

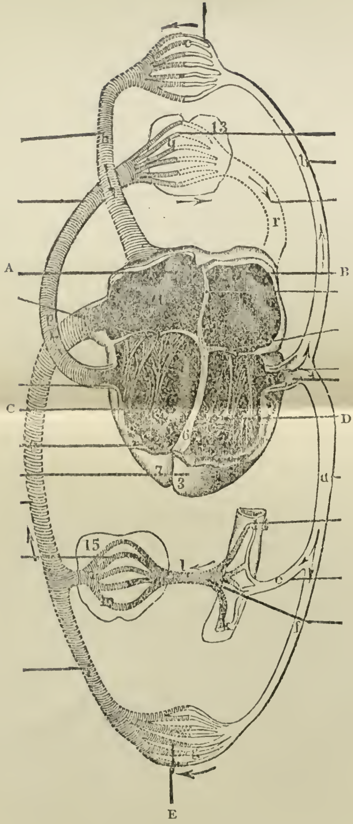


Fig. 8. Scheme of the Circulation.

A, right auricle; B, left auricle; C, right ventricle; D, left ventricle; E, capillaries.

The arrows show the direction of the current.

ricle; D, left ventricle; E, capillaries.
The arrows show the direction of the current.

up the waste products and convey them to the lungs, kidneys or skin, whence they can be thrown off and out of the system.

From the blood are also manufactured other fluids very necessary for the successful working of the body's wonderful mechanism, such as the digestive juices, the bile and milk.

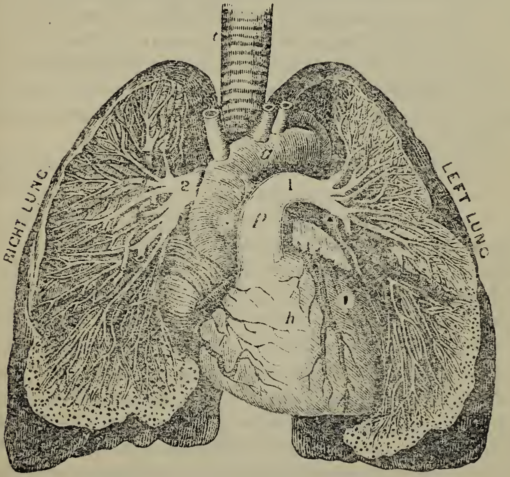


FIG 9. THE HEART AND LUNGS.

The blood is driven through the tubes of circulation by an organ called the Heart (Fig. 9.) which is somewhat like a double force-pump. From the left side of the heart the blood is pumped first into the tubes called Arteries. Your pulse is an artery, and its beat corresponds with that of your heart.

The arteries end in minute tubes called Capillaries, so named from a Latin word meaning a hair. From the capillaries the blood flows into the veins and through them back to the right side of the heart. (See Fig. 8.) From this point it is driven into the lungs, where it comes in contact with the atmospheric air we breathe. The oxygen contained in the air purifies the blood, which then passes on to the left side of the heart to be again pumped or driven out on the same ceaseless round of work and duty.

The heart is a hollow mass of muscle of a conical shape. In the human adult it weighs about nine ounces. It lies in the chest behind the breast-bone and chiefly on the left side. Its base is directed upward and backward, its point or apex extending below and inside the left nipple, where it can be felt beating. Fig. 8 shows a diagram of the interior arrangement of the heart. The two lower cavities, known as Ventricles, drive the blood out of the heart, the right one sending the impure venous blood to the lungs and the left one sending the purified blood to the arteries. The two upper cavities receive the blood, the right one the impure blood and the left one the pure blood from the lungs. Between the upper and lower cavities are valves whose function is to prevent any backward flow of the blood; therefore, when the heart contracts to drive out its supply of blood these valves are closed.

In heart disease the valves fail to close perfectly, consequently there is a leakage, resulting in enlargement and weakness of the whole organ. The lower openings, too have valves to prevent any backward flow of blood from the veins and arteries.

In a healthy person the heart beats from sixty-four to sixty-eight times a minute when the body is in a recumbent position; seventy to seventy-four times when in a sitting position and from seventy-four to seventy-eight when the body standing. Exercise, of course, increases the number of beats in a given time Bleeding quickens the beat, but also makes it weaker. Shock from an accident increases the rapidity of the beats, while injuries to the head cause the heart to beat slowly.

The Lungs.

In its passage through the body the blood takes up many impurities, the chief of which is carbonic acid gas. If this were allowed to remain in the body the result would be death by suffocation as surely as if one were to be confined in a room filled with illuminating gas. To get rid of this impurity the blood passes through the lungs and is there purified by the oxygen of the air. The process by which this purification is accomplished is called Respiration or Breathing. It consists of two distinct acts—Inspiration, by which air is taken into the lungs, and Expiration, by which air is expelled from the lungs.

The lungs, (Fig. 10,) are two large organs, which, with the heart, fill the cavity of the chest. They rest on an arched muscle called the Diaphragm, which divides the chest from the abdomen or belly.

The Trachea, or wind.pipe, is a flexible tube extending down the front of the neck from the root of the tongue to the top of the breast-bone, at which point it parts into two branches, one passing to the right and the other to the left. These branches again divide and subdivide until they finally terminate in very minute closed tubes. At its termination each tube becomes enlarged or bulged out and forms an air cell, as illustrated below in Fig. 10.

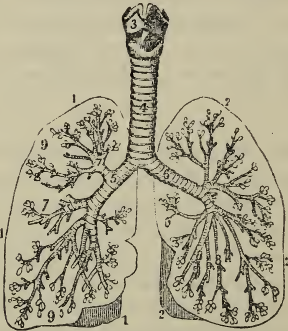


FIG. 10. DIAGRAM OF THE LUNGS, SHOWING AIR-CELLS.

The lungs may be likened to a bunch of grapes, the main stem being the windpipe, its branches the bronchial tubes and the grapes the air-cells.

Wrapped around each lung is a net-work of blood-vessels formed by the breaking up into branches of the Pulmonary artery and veins.

If the air-cells of the lungs could be shown as a flat surface they would cover a space of about eighty square yards.

In ordinary breathing we take in and expel about thirty cubic inches of air. We can, by a forced expiration, expel 100 cubic inches, but we shall still have 120 remaining.

The act of breathing is performed by a contraction of the chest muscles which raise the ribs. They are thus drawn upward and at the same time the diaphragm becomes straight instead of arched upward. This increases the depth of the chest from above downward. The air then rushes in through the windpipe and fills the air-cells.

Expiration is merely the collapsing of the ribs and the restoration of the diaphragm to its arched position.

Every air-cell is completely surrounded by little blood-vessels, by means of which the blood is brought into close contact with the air, only a thin membrane separating them. Here the blood gives to the air its carbonic acid gas and takes therefrom the life giving gas called oxygen.

About 686,000 cubic feet of air pass in and out of our lungs daily. You will thus see that all the oxygen in a tightly closed room can soon be used up, even by one person, and how necessary it is for our health that we keep our living, and especially our sleeping rooms well ventilated.

Normal breathing is about twenty times a minute. The breathing quickens with the heart beats in about the same ratio, say one to four.

The Nervous System.

All the processes or actions of the body are controlled by the Nervous System. This system consists of the Brain, the Spinal Cord and the Nerves that pass out or emanate from them. The nerves are of three kinds, Sensory, Motor and Sympathetic.

Sensory nerves convey to the brain such sensations as pain, heat and cold.

Motor nerves carry orders from the brain and induce the various members to act. Thus, an impulse to raise the arm does not originate in the arm; the brain gives the order, the motor nerves convey the order and the arm obeys.

Sympathetic nerves are beyond our control; that is, they regulate those functions of the body which require ceaseless action, which are always at work, whether we sleep or keep awake and, also, whether we will or not. These functions are Digestion, Circulation of the Blood and Respiration.

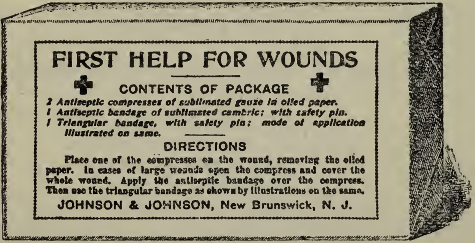
Collectively, the nerves make a very complete telegraph system within the body. This statement may be demonstrated thus: A person standing near a hot stove accidentally touches it with his hand. Instantly a telegram flies to the brain advising it that the hand is in danger; an order is immediately sent from the brain to the muscles of the arm and hand to take the part away and without a moment's hesitation the order is obeyed. The shortness of the time in which all this is done shows that the telegraph system within the body and the code of signals employed are more complete and effective than anything ever invented by Morse or Wheatstone.

CHAPTER II.

THE FIRST AID PACKET AND ITS USES.

The Packet.

The world owes to Esmarch, of Germany, the honor of having introduced the First Aid Packet. He it was who recognized that, to use his own words, "the fate of a wounded man depends on the person in whose hands he first falls." At his suggestion the German soldiers who took part in the Franco–Prussian war of 1870 were supplied with what was known as Esmarch's Triangle, the fore-runner of the modern First Aid Packet.



FIRST HELP FOR WOUNDS

CONTENTS OF PACKAGE

2 Antiseptic compresses of sublimated gauze in oiled paper.
1 Antiseptic bandage of sublimated cambric; with safety pin.
1 Triangular bandage, with safety pin; mode of application illustrated on same.

DIRECTIONS

Place one of the compresses on the wound, removing the oiled paper. In cases of large wounds open the compress and cover the whole wound. Apply the antiseptic bandage over the compress. Then use the triangular bandage as shown by illustrations on the same.

JOHNSON & JOHNSON, New Brunswick, N. J.

FIG. 11.

These packets are of two kinds. One is known as the Army Packet, (See Fig. 11) and contains a triangle, two gauze compresses, a ribbon bandage and two safety pins, all wrapped in oiled or paraffined paper and enclosed in water-proof cloth. On the outside are printed directions how to use the contents.

The other is a packet better adapted for civilians' use and its cost is less. It is known as Johnson's First Aid for Wounds. (See Fig. 12.) Besides a triangle, it contains a piece of antiseptic lintine for a compress, a ribbon bandage and two safety pins. This packet also is wrapped in oiled paper and put up,

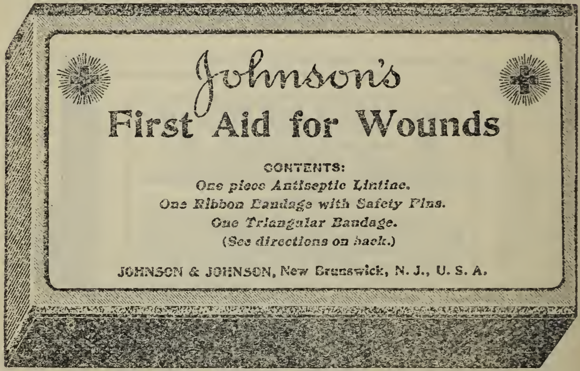

Johnson's
First Aid for Wounds
CONTENTS:
One piece Antiseptic Lintine.
One Ribbon Bandage with Safety Pins.
One Triangular Bandage.
(See directions on back.)
JOHNSON & JOHNSON, New Brunswick, N. J., U. S. A.

FIG. 12.

either in paste-board cartons for outside use, or wrapped in water-proof cloth for use in mines or other places where it may otherwise become damp,

These packets have been thoroughly sterilized, that is, steamed or exposed to heat great enough to kill all germs, before they are sealed.

A piece of cloth may appear to be clean and still be full of pestilential germs, in fact, a "whited sepulchre." Materials used next to wounds should be—again quoting from the Good Book—"tried as by fire."

These packets are never to be opened until needed; because exposure to the air and handling soon renders them unfit for use.

In the treatment of wounds the old proverb, "Cleanliness is next to godliness," seems to have double force, therefore, never touch an open wound with your hand.

To illustrate the superiority of the First Aid Packet over the old-fashioned methods, we will suppose one of your fellow workmen receives a severe cut on his arm. You, being a member of a First Aid Association, are called to his assistance. The wound is bleeding profusely; but you are not alarmed, for you are equipped with a First Aid Packet and the knowledge how to use it. You open your packet, put the compress or the piece of lintine on the wound, then take the piece of bandage and wrap it snugly round the arm, pinning it with the safety pins. You next make a sling of your triangle, put the man's arm into it and he is ready to be sent to his home and a doctor. You have probably stopped the bleeding, prevented dirt and injurious matter from getting into the wound, protected it from the cold and from the air, which contains germs, and last, but not least, you have made the man comfortable and thereby strengthened his chances for a speedy recovery. When the doctor comes he will find a comparatively clean wound to treat and when the cure has been effected he will be willing to testify that a large measure of praise is due to the man who intelligently rendered the First Aid.

Contrast this with a method often practised and which too often results in loss of life.

There is a man hurt; he shows a gaping wound; somebody takes a cud of dirty tobacco from between two sets of decayed teeth and puts it on the wound. Then a piece of an oil-soaked and dirt-laden sleeve is torn off and used as a bandage.

You can plainly see the good you are doing by the First Aid method; but the harmful results of the latter plan are too far reaching to be even approximately estimated.

Remember, never attempt to bathe or wash a wound, because the water that is handy is very likely to be impure and will infect the wound. Water for washing wounds must be boiled and then allowed to cool—not cooled by the addition of cold water.

The soldiers who took part in the campaign around Santiago in July, 1898, were supplied each with a First Aid Packet. Notwithstanding the terrible tropical climate and the lack of proper shelter from sun and rain, there was never before less blood poisoning from infected wounds, and this happy result was due wholly to the use of the First Aid Packets.

With such an object lesson in view, it ought not to be difficult to enact a national law to compel all railroad, mining and manufacturing companies to supply a certain proportion of their employes—say one person in sixteen—with First Aid Packets.

Bandaging.

The triangle can be used in many ways. You can make two triangles for practice from a piece of cotton cloth of medium weight and forty inches square. This should be cut in two diagonally as in Fig. 13.

FIG. 13.

The triangle may be used as a broad or a narrow bandage. To make a broad bandage, spread out your triangle with the point away from you, as in Fig. 14, then bring the point toward you and place it on the lower border, then make one more fold in the same direction. The narrow bandage should be commenced in the same way, but it requires one more fold.

Always fasten the bandage with the safety pin from the First Aid Packet, or else tie it with a knot similar to the one illustrated in Fig. 15 on the next page.

Following are a few simple directions for applying the bandage to the various parts of the body.

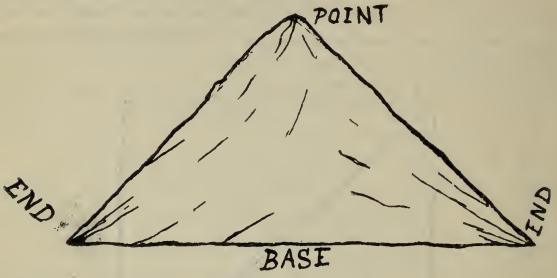


FIG. 14

To Bandage the Scalp.

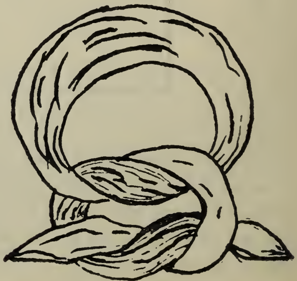


FIG. 15.

Fold a hem about 1½ inches deep along the base, place the hem on the forehead close down to the eye-brows, with the point hanging over the back of the head, bring the two ends around the head above the ears, cross them at the back and tie on the forehead; draw the point downward till the bandage fits like a skull cap; turn the point upward and pin it at the top of the head. See Fig. 16, which shows the front and back views of the applied bandage.

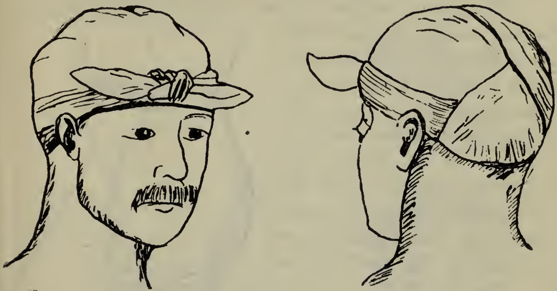


FIG 16.

For the forehead, side of the head, eye, cheek, arm or thigh the narrow form of bandage must be used, placing the middle of the bandage on the wound, carrying the ends round the limb and tying over the wound.

To Bandage an Injured Shoulder.

Place the middle of the triangle on the injured part with the point up the side of the neck; carry the ends round the middle of the arm and tie them; take a second triangle, fold it in the broad form, place one end over the point of the first bandage, sling the arm by carrying the other end of the bandage over the sound shoulder and tying it at the side of the neck; bring the point of the first bandage under that part of the sling resting on the sound shoulder, draw it tight, turn it down and pin it.

To Bandage an Injured Hip.

First, put a narrow bandage round the body above the haunch bones as a waist-band, tying the knot on the same side as the injury. Then take a second triangle, turn up a hem on the base, put the middle of the hem on the wound, pass the ends round the thigh and tie them; then draw the point under the first bandage, turn it down over the knot and pin it. (See Fig. 17.)

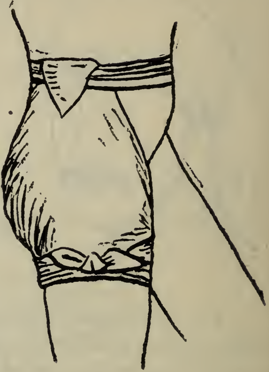


FIG. 17.

To Bandage the Hand.

Place the wrist on the base of a triangle with the fingers directed toward the point; bring the point over the hand and place it on the wrist, pass the two ends round the wrist and tie them.

To Bandage a Foot.

Place the injured foot in the middle of a spread triangle with the toes toward the point, bring the point over the instep and the two points forward, cross them and tie either on the sole or round the ankle. (See Fig. 18 on next page.)

Large Sling for the Arm.

Spread out a triangle, put one end over the sound shoulder letting the other end hang in front of the chest; carry the

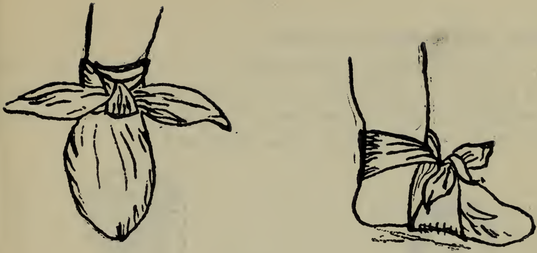


FIG. 18.

point behind the elbow of the injured arm and bend the arm forward over the middle of the bandage; carry the hanging end over the shoulder of the injured side and tie to the other end behind the neck; bring the point forward and pin to front of the bandage. (See. Fig. 19.)

Small Sling for the Arm.

Fold the triangle into a broad bandage, place one end over the shoulder on the sound side, bend the arm over the middle of the bandage, then pass the hanging end over the injured shoulder and tie to the other end

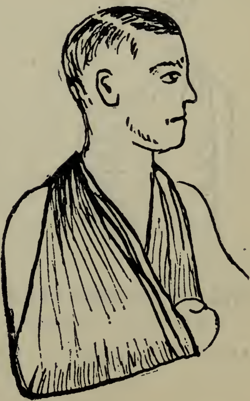


FIG. 19.

How to Bandage the Chest.

Place the middle of the triangle on the injured side with the point on the shoulder; pass the two ends round the body and tie them behind. then draw the point over the shoulder and tie to one of the ends. (See Fig. 20.)

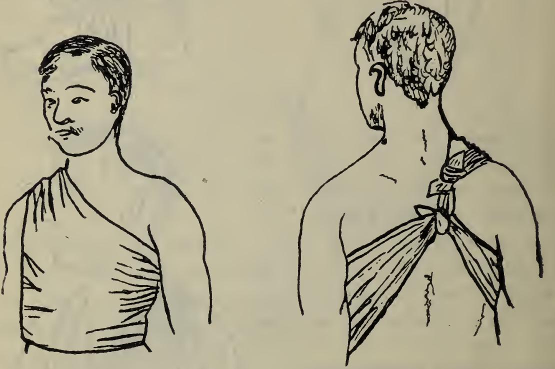


FIG. 20,

How to Bandage the Back.

The back is bandaged in the same manner as the chest, except that the positions are reversed.

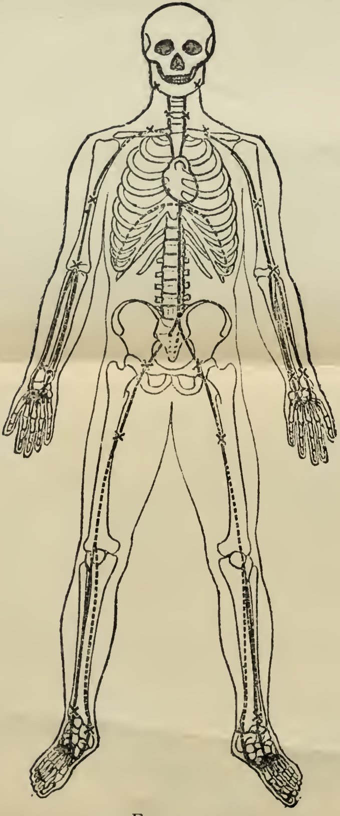


FIG. 21.
THE CROSSES INDICATE WHERE PRESSURE SHOULD BE APPLIED TO ARREST BLEEDING.

Should be Applied to Arrest Bleeding.

CHATPER III.

HEMORRHAGE.

Hemorrhage or Bleeding is caused by the rupture of a blood-vessel, which may be either an Artery, a Vein or a Capillary.

Capillary bleeding is usually the result of a scratch or graze, from which very little blood is lost, except in certain persons known as "bleeders." These persons bleed very profusely from a slight wound. Such bleeding is readily stopped by applying the compresses from a First Aid Packet, or a compress may be made from a piece of clean cloth and held in place by the triangle or a bandage.

Venous bleeding, which indicates the rupture of a vein, is of much more importance, It is easily distinguished by the dark color of the blood as it wells up from the wound. A compress should be applied to the wound and tied there with the triangle or a roller bandage. If, however, this does not stop the flow of blood, on account of the ruptured vein being a large one, apply a tight bandage on that side of the wound farthest from the heart.

In connection with all bleeding it is important to remember that the flow of blood in the veins is TOWARD the heart, while that in the arteries is FROM the heart. In a case of venous bleeding, therefore, the limb should be elevated and kept so till the arrival of a doctor.

Some people are peculiarly subject to bursting of varicose veins in the legs. The treatment indicated in the preceding paragraph must be followed, the patient being placed on a bed or lounge with the leg raised higher than the head. Garters and straps round the knees must be taken off.

Bleeding at the nose is best treated by placing the patient in a chair with the head raised, then apply ice or cold water to the forehead and nose. Or hold the nose tightly between the finger and thumb. Cotton soaked in strong vinegar and put up the nostrils is very beneficial.

In all cases of vomiting of blood, either from the lungs or stomach, the patient should be kept very quiet and given small pieces of ice to suck.

Arterial bleeding, or the rupture of an artery, is the most serious of all forms of bleeding; because, if the injured artery be a large one, unless the flow of blood is speedily stopped the patient will bleed to death.

In arterial bleeding the blood has a bright red color and it spurts from the wound in a series of jerks, corresponding with the beats of the heart.

Pressure must be applied without delay by the thumb or fingers, which may afterward be replaced by a compress and bandage. If the bleeding still continue, the main artery supplying blood to the injured one must be compressed, and this must be done at some part where the artery passes over a bone, yet as near the wound as possible. Referring to Fig. 21, you will find the spots most favorable for compression indicated by small crosses.

Do not apply enough pressure to cause severe pain, but just enough to stop the flow of blood.

A very handy form of a tourniquet for immediate application can be made by tying a knot in the middle of a triangle or, in the absence of that, a large handkerchief as in Fig. 22. If the latter is used it may be advisable to put something solid inside the knot. Place the knot on the artery and tie the ends round the limb to hold it in place. If the pressure thus applied fails to stop the bleeding pass a short stick under the bandage, which you can then tighten by giving the stick a twist or two. Having by this method stopped the flow of blood, secure the end of the stick by another bandage or a piece of string.

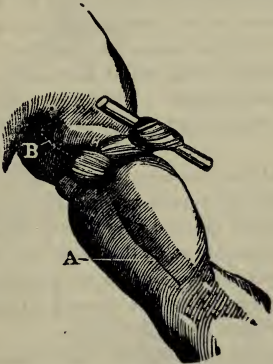


FIG. 22.
THE LINE A—B INDICATES THE COURSE OF THE ARTERY.

For arterial bleeding about the head apply pressure directly on the wound, thus compressing the injured artery against the skull.

If an artery of the face be ruptured and the wound be over a bone, apply pressure in the same manner as for the head.

If there be an arterial wound in the cheek the patient should put his forefinger in his mouth and compress the wound between his finger and thumb. Treat a wound on the lips in the same manner, that is, apply pressure to both sides of the wound.

For a wound of the Temporal artery, which runs up the side of the forehead, apply a compress and a bandage.

In wounds of the Carotid artery, the great artery which on each side distributes blood to the head, the bleeding may be stopped by putting the fingers into the wound and pressing the artery against the spine. Care must be taken, however, not to apply the pressure to the wind-pipe.

If arterial bleeding be in the arm, that is, above the elbow, compress the Brachial artery. This is easily found, its course being well indicated by the inner seam of a man's coat sleeve. Extend the arm with the palm upward and the seam will lie directly over the artery. This artery must always be pressed down to the bone; never grasp it from above, lest it be pressed against soft muscle, in which case the bandaging would be ineffectual. Apply a tourniquet as shown in Fig. 22. See also the lower part of Fig. 23.

If the wound be between the elbow and the wrist, that is, in the forearm, and direct pressure fails to stop the bleeding, apply a pad in the fold of the elbow, bend the forearm upward and tie it firmly to the arm.

For arterial bleeding in the palm place a pad of some firm

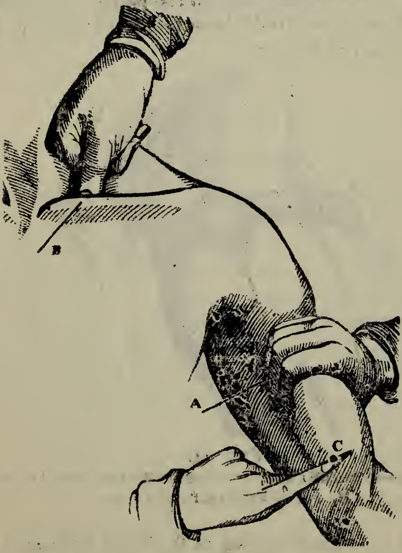


FIG. 23.

material on the wound, close the fingers and then put a triangular bandage round the fist, after which put the arm in a sling.

Arterial bleeding in the armpit requires a firm pad pressed into the armpit and the arm bound to the side. If this does not stop the bleeding, compress the Subclavian artery. This artery is found behind the inner bend of the collar bone, lying on the first rib. Put your hand on the patient's shoulder and with your thumb press firmly down into this hollow as shown in the upper part of Fig. 23.

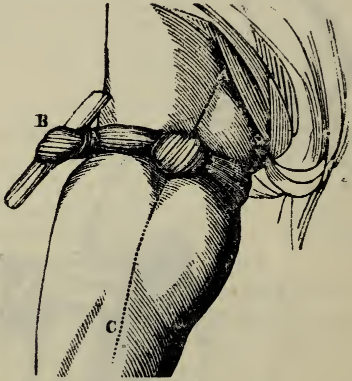


FIG. 24.
THE LINE A—C MARKS THE COURSE OF THE FEMORAL ARTERY, B, A TOURNIQUET APPLIED.

If there is arterial bleeding in the lower limbs and above the knees the Femoral artery must be compressed. This artery commences at the middle of the fold of the groin and runs downward toward the inner side of the thigh, About one third of the way down it buries itself under the muscles and cannot be felt again till it reappears behind the knee.

The flow of blood may be stopped by placing the thumb in the groin and pressing the artery against the front of the haunch bone, or by a tourniquet applied lower down as shown in Fig. 24.

CHAPTER IV.

FRACTURES.

The fractures most commonly met with are Simple, Compound, Comminuted and Complicated.

A Simple fracture is one in which only a bone is broken.

A Compound fracture means that the bone is broken and there is also a wound through the skin leading down to the broken ends of the bone. Sometimes this wound is produced by the same agency that caused the fracture of the bone; but sometimes, also, it is the result of improper handling, such as placing a man with a broken thigh in a carriage or ambulance before applying splints.

A Complicated fracture is one in which the bone is broken and some of the surrounding parts injured thereby, as when a rib is driven into the lungs or liver, or when an artery or vein is punctured by a broken bone.

A great deal of suffering can often be prevented if the person rendering First Aid is well able to distinguish between

Fractures and Dislocations. Here are the distinguishing signs:

In Fractures:

1. There is diminished power in the limb or part.
2. There are pains and swelling at the injured part.
3. When the injured limb is compared with the sound one, some distortion is readily seen; it is usually shorter, or it lies in an unnatural position, or it shows an angle where it should be straight.
4. If the limb be gently pulled it will regain its natural shape, but when liberated it will again become distorted.
5. If the limb be gently moved a motion will be observed somewhere in the shaft of the bone instead of at the joint, and a grating sensation will be felt.
6. If the bone be near the skin the irregularity may be easily felt by passing a finger lightly along the limb.

In Dislocations:

1. The injury is always at a joint.
2. The limb is more firmly fixed, instead of being unnaturally movable.
3. The limb cannot be brought to its natural position by gentle pulling.
4. There is no grating sensation to be felt.

In all examinations the parts must be handled very gently, and if you cannot decide whether it is a fracture or a dislocation, treat it as a fracture.

If the accident happens in the open air let the patient's clothing stay on to protect the part from the cold and also to serve as padding for splints.

If the arm be dislocated or fractured, put it in a sling. If it be the leg or thigh that is injured, put the patient in as comfortable a position as possible and send for a doctor. But if a member of a First Aid Association be within reach, place the patient under his care and obey his wishes till the doctor comes.

Fracture of Skull.

In most fractures of the skull the patient will probably be unconscious. If the fracture be at the base of the skull there will be bleeding from the mouth, nose or ears; probably a discharge of sticky, bloody fluid from the ears. If the roof of the skull be fractured it is very likely a compound fracture, in which case the bone may easily be seen.

The patient must be placed on a bed or sofa, the head slightly raised, and kept very quiet till a doctor can be fetched.

Fracture of the Jaw.

Owing to the dropping of the jaw, the mouth will remain open, thus depriving the patient of the power of speech. If the finger be passed over the teeth, along the outside of the jaw a depression may be felt and, perhaps, also the rough edge of the bone. There may also be some bleeding of the gums.

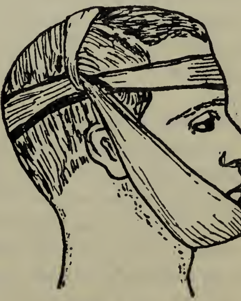


Fig. 25.

Raise the jaw very gently to its natural position; then make a narrow bandage of your triangle, pass this round the jaw and over the head, cross the ends above one ear, carry the two ends round to the opposite side and there tie them. Fig. 25.

Fracture of the Collar Bone.

The patient will be unable to raise his arm above his shoulder. Passing the finger along the collar bone a depression and sharp edge may be felt, as if the bone were coming through the skin. The patient's head will be inclined toward the injured side.

From a triangular bandage or a handkerchief make a firm pad and place it in the armpit; with another triangle make a sling and put the arm into it; then place a broad bandage as near the elbow as possible and pass it round the chest to hold the limb close to the body, the object being to make a lever of the arm to draw out the outer end of the fractured bone.

Fracture of the Arm.

Apply two, three, or four splints, holding them in position with two bandages, one each side of the fracture, securing the upper one first. Then put the arm in a sling so that the weight of the forearm may draw the pieces of broken bone into position. See Fig. 26.

Almost anything handy that is

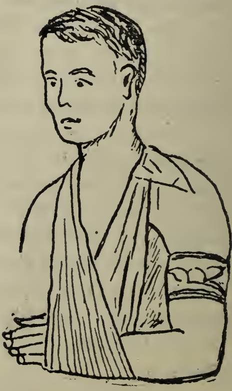


FIG. 26.

stiff enough to hold the limbs in position may with propriety be used as a temporary splint. Such articles are a policeman's

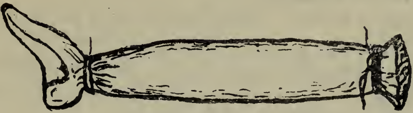


FIG 27.

club and his cape; a stocking tied at the ankle and filled with moss, hay or even sand, and then tied at the top, (See Fig. 27) rolls of newspapers, hammer handles, canes and umbrellas. But when any hard substance is used always eover it with some soft material before applying it to the injured limb.

In the absence of triangular bandages or First Aid Packets, secure the splints with handkerchiefs, neckties, shoe-laces, straps or strings. In all cases put the limb in a position as natural as possible before applying splints.

Fracture of the Fore-arm.

If both bones are broken the usual signs of fracture will be observed; but if only one is broken the signs will be loss of power in the limb, a depression at the seat of the fracture and great pain at the same point. In either case the treatment will be as follows:

Bend the fore-arm, keeping the thumb upward; then apply two splints, one on the front or inside of the fore-arm, the other opposite. The inner splint should reach from the bend of the arm to the tips of the fingers, the outer one from the elbow to a little below the wrist. Secure the splints with a bandage on each side of the injury and put the arm in a sling.

Fracture of Fingers.

Apply a narrow, padded splint under the finger, holding it in position with a narrow bandage of linen, then put the arm in a sling. If several fingers are damaged use a splint as broad as the hand, well padded, and after it is secured by bandaging put the hand and arm in a broad sling

Fracture of Ribs.

The patient will complain of a sharp pain on taking a deep breath or coughing; he breathes in a short, jerky manner and keeps his hand pressed on the injured spot to prevent the movements of the side. Placing your hand over the fracture, a grating may be observed as the patient breathes and the ends of the broken bones may be felt.

Tie two triangular bandages firmly round the chest, making the upper part of one and the lower part of the other cover the seat of pain.

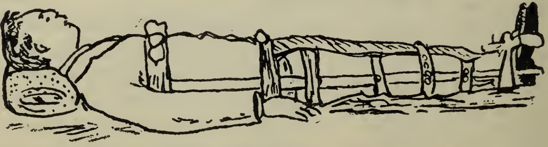


FIG. 28 .

Fracture of the Thigh.

This fracture calls for more bandages than any other, also for longer splints. The latter must reach from the armpit to the foot. Place a splint on the injured side and secure it with the following bandages: One round the body at the chest, one round the body at the pelvis, one round the thigh above the fracture, one round the thigh below the fracture, two round the leg below the knee and then two more round both legs to hold them firmly together. Fig. 28.

If the patient be a woman, first tie both legs together, then apply a long splint outside the clothing on the injured side.

Splints for fractures of the thigh can be improvised from broom handles, billiard cues, rifles or any long piece of wood. Even an umbrella may be used, and if properly applied, as shown in Fig. 29, makes a very good splint.

In the absence of other material the sleeve of a coat may be turned inside out and filled with paper. straw, twigs or leaves, then placed alongside the injured limb and secured with bandages. (See Fig. 30.)

Fracture of the Leg.

If only the shin bone be broken the fracture can easily be located by passing the hand lightly along the leg when the broken ends can be felt. If only the brooch-bone

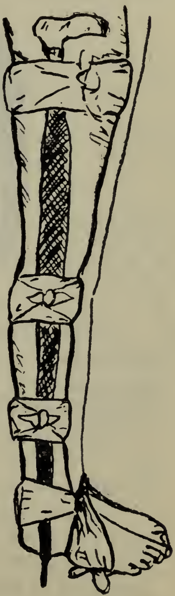


FIG. 29.

is injured there will be inability to use the limb, also much pain and swelling. When both bones are broken the usual signs of fracture are easily observed.

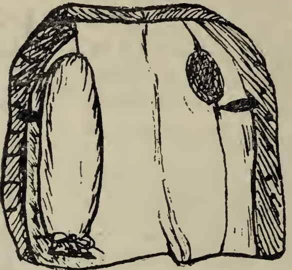


FIG 30.

Apply two splints, one on the inside and the other on the outside of the leg; secure them with bandages, then tie both legs together.

Fracture of the Knee-cap.

Some edges of the broken bone may be felt under the skin. The leg will probably be bent backward and the patient unable to raise it.

Tie a well padded splint behind the leg, to reach from the thick part of the thigh to the heel, filling in behind the knee joint with more padding.

Fracture of the Spine.

The patient will probably be unable to move, and, if the injury be severe, he will have no power nor feeling in his legs.

Do not attempt to make him sit up. If a First Aid man be near he will show you how to handle him; but if not, place the patient as carefully as possible on a stretcher and carry him to the nearest house.

Important Notes on Fractures.

Always put a fractured limb in splints, or in some way prevent any movement of the broken bones, before attempting to carry the patient any distance.

When arterial or venous bleeding accompanies a fracture, stop the bleeding first, then attend to the fracture.

Sprains.

Handle a sprain as little as possible. If the sprain be very severe the part may be put in splints; otherwise, tie a triangular bandage firmly round it and carry the patient to his home or to a doctor.

CHAPTER V.

INSENSIBILITY.

Accidents and sudden sickness sometimes produce sudden insensibility, which may last for a short or long period according to the extent of the injury. Before attempting to restore a person who has suddenly become unconscious, it is well to ascertain the cause of the trouble.

Loosen the clothing round the neck, also any other part of the clothing that may be tight, especially belts and suspenders. Then, beginning at the head, pass the hand over the body to discover if there be any fracture, or any wound from which blood is flowing. If you find such, deal with them according to the instructions given in previous chapters.

But if neither wounds nor fractures are found, the patient should be carried into a house, laid on a sofa or bed with the head rather low, and a messenger sent for a medical man.

Apoplexy.

The signs of apoplexy can scarcely be mistaken. They are: Sudden insensibility, labored breathing with a snoring noise, cheeks puffed with each expiration, pupils of the eyes unequal, and while one side of the body may show evidence of feeling the other side shows none.

Place the patient on a bed or sofa with the head slightly raised. Loosen all tight clothing, then apply heat to the feet and legs and cold water cloths to the head. Give no stimulants, emetics or drinks of any kind; but send for a doctor.

Epilepsy or Falling Sickness.

This form of sudden insensibility is usually preceded by a piercing shriek, then an absolute loss of consciousness. As a result of numerous muscular contractions, the hands are clenched, the face distorted, the limbs twisted and breathing suppressed. Often there is foam at the mouth, sometimes streaked with blood. After a few minutes the muscular spasms cease, there is a gradual return to consciousness, and, having opened his eyes, the patient either gets up and walks away or falls into a sleep which may last some hours.

The treatment consists in loosening the clothing, removing any furniture or other objects against which the patient may hurt himself, and, to protect the tongue from being bitten, put a piece of cork or some such substance between the teeth. Make no effort to restrain the patient's movements, and if, after the fit is over, he desires to sleep let him do so.

Fainting.

This may be caused by fright, bodily exhaustion, loss of blood or mental emotion. It is easily distinguished from an apopletic or epileptic fit by the extreme paleness of the face, the clammy sweat on the forehead and under the eyes and the temporary weakness of the pulse, amounting to almost a complete cessation.

Loosen the clothing round the neck and chest, bathe the face and hands in cold water, and, to induce a normal flow of blood to the head, put the patient flat on the floor without a pillow.

If the fainting be due to loss of blood attend to the wound and give some stimulant, such as tea, coffee or wine, always remembering when administering stimulants to the sick that a spoonful is better than a pint. The same rule applies to the food furnished if fainting is brought on by extreme hunger.

Concussion of the Brain.

This is more likely to occur in children than in adults, and is often the result of falls, jumps from high places or blows on the head.

Having satisfied yourself that there is no fracture of the skull, lay the patient on a bed or sofa, apply warm bottles and flannels to the feet and let him sleep.

In severe cases the substance of the brain is bruised; then the symptoms and treatment are identical with those of apoplexy.

CHAPTER VI.

POISONS.

In all cases of poisoning send immediately for a medical man.

Alcoholic Poisoning or Drunkenness.

Generally detected by a strong odor of alcohol from the breath. The skin is cold and clammy; the patient lies perfectly helpless; when questioned, the answer, if any, will be incoherent and unsatisfactory.

If perfectly sure that the patient has been drinking and is intoxicated, give an emetic of one table-spoonful of salt in a glass of warm water, or a teaspoonful of mustard in a similar quantity of warm water. After this has operated let the patient sleep. Give no stimulants but hot tea or coffee.

Opium or Laudanum.

In the first stage of opium poisoning the face may be flushed, the breathing deep and slow, the pupils contracted; the patient drowsy, but may be roused by a shout. Later, if the patient gets worse, the breathing is slower, the face pale, the pupils contracted to the size of pin heads and the drowsiness increases so that he can be roused only with difficulty.

Administer an emetic, but on no account allow the patient to sleep. Two friends should support him and keep him walking to and fro. Give frequent doses of strong coffee.

Poisoning by Alkalies.

Under this class of poisons are caustic soda, caustic potash and ammonia. They produce a feeling as of intense burning, extending from the throat to the stomach. The mouth will be inflamed and of a deep red color. Probably some pieces of the lining membrane will be hanging loose.

Wash the mouth with diluted vinegar, lemon juice or tartaric acid, then give sweet oil, milk, white of eggs or gum water.

Poisoning by Acids.

This will include sulphuric acid or oil of vitriol, nitric acid or aqua fortis, and hydrochloric acid or spirit of salt. These poisons produce intense burning in the mouth and make the act of swallowing extremely painful. The mouth will be swollen and covered with a white skin.

Wash the mouth with a solution of chalk, whiting or magnesia and water or milk; then give the patient a little sweet oil or milk to drink.

Poisoning by Phosphorus.

This is generally the result of sucking phosphorus matches.

Give an emetic; after it has acted give drinks of magnesia and milk. Never administer any form of oil for this kind of poisoning.

Carbolic Acid Poisoning.

This creates a great burning sensation in the mouth, which will be white and shriveled. There will also be the well known smell of tar or carbolic acid

Use sweet oil very freely as a wash for the mouth.

Oxalic Acid Poisoning.

A strong acid taste pervades the mouth, also a burning in the throat and in the stomach; afterward the contents of the stomach will be vomited, perhaps with a quantity of blood.

The antidote is chalk or whiting mixed in water.

Other Poisons

Such as salts of copper, arsenic, Paris green and other minerals, also vegetable poisons, require common emetics, such as warm water, a table-spoonful of salt or a teaspoonful of mustard in warm water.

If the patient be cold, apply heat to the extremities. If retching continue after the stomach has been emptied, give warm water, or warm milk and water to drink.

Poisoning by Gas.

This is a very common accident to miners and workers in sewers and wells, sometimes occuring in dwellings where gas is used as an illuminant. The patient is found insensible, the face pale, the lips dark, the tongue livid, swollen and probably protruding between the teeth, the hands clenched and the nails bluish.

As quickly as possible carry the patient into fresh air, loosen the clothing round the neck and chest; then bathe the face and chest with cold water; the object being to restore natural respiration as early as possible. If these methods fail, employ artificial respiration, which will be the subject of our next chapter.

CHAPTER VII.

ARTIFICIAL RESPIRATION.

This is a method of inducing natural breathing through artificial means. It must be employed in all accidents, whether by poison or otherwise, which have caused the breathing to become very feeble or to stop altogether. Such cases are poisoning by gas—often called asphyxiation—choking, hanging, drowning and electric shock.

In a case of drowning, having got the patient into a boat or on land, loosen the clothing round the neck, chest and waist; clear the mouth of weeds, mud or other foreign matter; turn him face downward and lift him slightly to let the water run out of the throat and air passages; then roll him over on his back, draw the tongue forward and keep it so by passing a band over the tongue and under the chin. Then commence

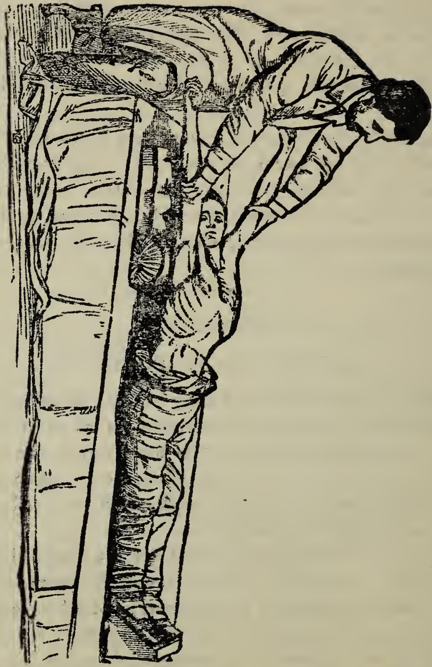


FIG. 31. FIRST POSITION IN THE SILVESTER METHOD OF ARTIFICIAL RESPIRATION.

artificial respiration by Dr. Silvester's method as follows:

1. Put a block under the shoulders, pulling the head well

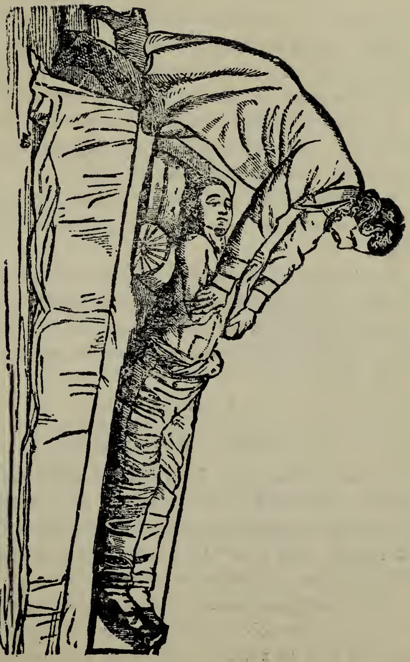


FIG. 32. SECOND POSITION IN THE SILVESTER METHOD OF ARTIFICIAL RESPIRATION.

back. Place yourself at the head, take hold of the patient's arms above the elbows and draw them upward until they nearly meet above his head. (See Fig. 31.) Then move them back to the sides and press for a moment or two with both hands on the lower part of the breast-bone. (See Fig. 32.) Repeat these movements without intermission and at the rate of about fourteen times a minute. Keep it up fully half an hour.

2. Dash cold water, or water heated to 120° F., on the naked chest. As soon as the natural movements of breathing are renewed, cease the artificial method.

3. Maintain the temperature of the body by friction, hot baths and warm blankets. Keep a current of fresh air about the head.

4. As soon as the patient can swallow, give warm milk, tea, coffee, or in extreme cases, a little stimulant, either brandy or aromatic spirit of ammonia. Put him in a warm bed, but not in a tightly closed room, and encourage him to sleep.

CHAPTER VIII.

ELECTRIC SHOCK.

The use of electricity for lighting and for the transmission of power, sound and heat is coming more into vogue every year, and, as a natural consequence, accidents originating in the so called "live wire" are becoming more frequent.

The ordinary trolley wire current has a power of about 500 volts; the incandescent and arc light currents are as high as 2,500 to 3 000 volts. Suppose one of these charged wires breaks and falls on a man, how would you, with perfect safety to yourself, rescue him from the death dealing wire? It can be done, and this is how you must do it.

If the man has been thrown down with the wire under him, provided the pavement or ground is dry, you will be perfectly safe in taking him by the shoulders, outside his clothing, with your bare hands and pulling him off the wire. But if the ground be wet, you had better get a board, place it alongside the patient, then, standing on it, draw the man away.

If the wire is lying on the patient, take a short board or a stick and flip it off.

Then, although your patient be insensible and his respiration has apparently ceased, do not despair of saving his life. As quickly as possible loosen his clothing and commence artificial respiration according to the instructions given in the preceding chapter. Keep it up fully thirty minutes, for by its means men have been revived who have been in contact with 5,000 volts.

Do not forget to send without delay for a physician, and while your messenger is on the road keep up your efforts to restore natural respiration.

If you happen to have a rubber coat, rubber gloves or a silk handkerchief, you should use them on your hands; but do not wait for such articles to be obtained, for in a case of electric shock the moments are precious, and a life may be lost by waiting or saved by promptitude and perseverance.

CHAPTER IX.

MISCELLANEOUS ACCIDENTS.

Strangulation.

Accidents involving this may occur to children from various causes and also to intoxicated persons.

Having cut the compressing band from round the throat, commence artificial respiration if necessary. Do not forget to draw the tongue forward, as instructed on page 61. Also see that bystanders do not exclude the necessary fresh air.

Choking.

This occurs when a piece of meat or other substance gets into the windpipe instead of the gullet, thus instantly stopping the process of respiration.

Boldly and firmly carry the thumb and forefinger to the back of the mouth and try to grip the obstruction and draw it out. If you fail, waste no time, but, as speedily as possible, induce the patient to vomit. To do this effectively, lay the patient on his back, put your knee on the pit of his stomach, then, as you put some weight there, with your open hand slap him smartly on the cheek. This will cause an effort to take a deep breath and vomiting ensues If the patient remains insensible after the obstruction is removed, commence artificial respiration.

Hanging.

The first thing to do is to cut the rope. Then, if the patient does not breathe freely, commence artificial respiration.

Too many persons run for assistance first and try to save life afterward. This order should always be reversed

Bites of Animals.

If the animal that causes the wound be rabid, apply a ligature immediately to the limb between the wound and the heart. The wound may then be washed with pure water. (See page 32). If the patient has no sores or cracks on his lips, he should suck the wound, after which it should be cauterized with lunar caustic. nitric acid or hot irons. In case of faintness. give sweet oil and a stimulant.

Snake Bites.

The general treatment of snake bites is the same as for hydrophobia, given in detail in the preceding paragraph.

Insect Bites.

Bathe the wound with a strong solution of ammonia; then cover it with a cloth wet with the same solution.

Burns and Scalds.

Exclude the air from the wound as early as possible. The most effective way of doing this is to cover it with common wheat flour. This is always handy, its use requires no skill and it has the merit of being exactly what a doctor would recommend.

If the case be serious and removal of the clothing becomes necessary, have everything else ready before removing any part of a garment. Then do not drag it off hurriedly. If it adheres to the wound, pour sweet oil over it or cut around it with scissors.

Never hold a burn before a fire.

Sunstroke.

The patient may fall suddenly or complain of throbbing in the head with a faint, sick feeling.

Send for a doctor. Remove the patient to a cool place and apply ice or very cold water to the head. Remove all tight clothing. Administer no stimulants.

Frostbites.

The injured part turns very white and there is no feeling therein.

Do not hurry the patient into a warm room. Thaw out the part slowly, by friction only, till sensation returns

Foreign Substances in the Eye.

If the substance be under the upper eyelid, seat the patient in a chair, stand behind him, place a bodkin or toothpick on the eyelid and turn it upward, thus exposing the inner side. Then, with a corner of a handkerchief, or something softer, brush the substance off. If the substance be under the lower eyelid, depress the lid and brush away the intruding object.

Foreign Substances in the Ear.

Put a few drops of warm oil into the ear and then let it alone till you can get the patient to a doctor.

If an insect gets into the ear, drown it with a few drops of water or stupefy it with a few puffs of smoke.

CHAPTER X.

CARRYING THE INJURED.

Nearly all accidents occur where there are no stretchers at hand; therefore it is necessary to devise on the spot some means of carrying the injured person to shelter and safety.

If the injured person be unable to walk, has not lost consciousness, and can use his arms, a good idea to adopt is the four-handed seat or "lady's chair" of children. (See Fig 33.) To form it two men grasp each his left wrist with his right hand, and with his left hand grasps his fellow's wrist. Seated on this, the patient throws his arms over the shoulders of the bearers.

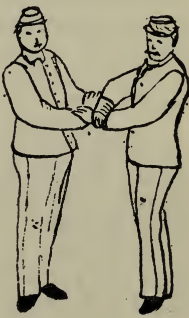


FIG. 33.

A two-handed seat is more comfortable, both for the patient and the bearers. The right hand bearer grasps with his right hand the left wrist, and with his left hand the right shoulder of his fellow-bearer; the left hand bearer grasps with his left hand the right wrist of his fellow, and with his right hand the left shoulder. (See Fig. 34.)

If the patient be a short person the bearers may grasp each other's hips instead of the shoulders. If he be absolutely helpless, the bearers should kneel one on each side, pass their hands under his knees and shoulders, grasp each other's wrists and rise. This is also a good method for lifting a person from a chair to a bed.

If you are alone with an injured person and you cannot by calling procure assistance—and such incidents often occur at fires and mine accidents—the whole duty of carrying the patient rests on yourself. For the comfort of the patient and your own convenience it is important, therefore, that you know how to handle him single-handed. There are four methods of doing this.

1. The bearer merely assists the patient to walk.

2. The patient is carried in the bearer's arms.

3. The patient is carried on the bearer's back, or "pick-a-back."

4. The patient is to be carried on the bearer's shoulders.

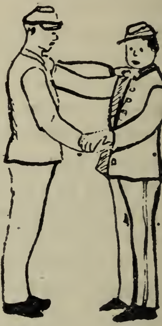


FIG. 34.

First Method.

The patient is probably suffering from a comparatively slight injury of the upper part of the body, his legs uninjured. Stand by his side; put his sound arm over your shoulder and behind your neck; grasp his hand with your own and pass your other arm round his waist to support him. A single bearer may thus, if necessary, assist two slightly injured persons.

Second Method.

The patient is lying on the ground, probably insensible, and totally helpless. (1) Turn him face downward, (2) stand astride him and with your hands in his armpits raise him to a kneeling position, (3 shift your hands along his body and clasp them in front, (4) then lift him to his feet; (5) still holding him erect, shift yourself so that his right side will be against you and your hands under his left armpit; then, (6) retaining your left hand and arm in place, pass your right arm behind his thighs and lift him into your arms. This method is very easy for the patient but hard on the bearer; therefore, it is used only when the patient is insensible and his destination not distant.

Third Method.

This method of carrying a patient was recommended by Captain Shaw, of the London Fire Department. It is comfortable for the patient and easy for the bearer and is particularly recommended when the patient is not insensible, but is unable to render his bearer any assistance.

(1) Turn the patient face downward, (2) seize him under each armpit and raise him to his knees, (3) shift your arms about his waist, clasp your hands in front of his body and lift him to his feet; (4) retaining your right hand in position, grasp the patient's left hand with your left hand and draw his left arm about your neck, bringing his hand down in front of your chest; then (5) stooping slightly, pass your right hand around in front of his thigh, grasp it and he will then fall across your back; (6) now stand erect and balance the body on your back. (Fig 35.)

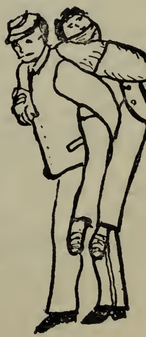


FIG. 35.

Fourth Method.

Carrying a patient on your shoulder is accomplished in the same way, except that when you have turned your patient face downward you stand at his head, raise him to his knees and then to his feet so that he is facing you; stoop and put your right shoulder against his stomach so that his body falls over your back, then pass your right hand between his thighs and with your left hand grasp the patient's right hand and draw it under your left armpit till you can grasp his right wrist with your right hand; then stand erect. Fig. 36.

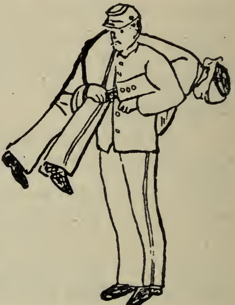


FIG. 36.

This method has the advantage of leaving the bearer with one hand free to control the patient in case he struggles or is delirious.

In carrying a female patient the right arm is to be passed around both thighs.

To lower the patient the bearer drops to his knees, bends gently forward till the patient rests on his buttocks and then withdraws his hands.

Transportation of Patients.

When a stretcher is needed and there is none at hand, one can be improvised in a number of ways

Get two stout poles about seven feet long and two vests buttoned, pass the poles through the arm holes of both vests and you have an excellent temporary stretcher. Or you can use two coats if you first turn the sleeves inside out, button the coats and then pass the poles through the sleeves. See Figs. 37 and 38.

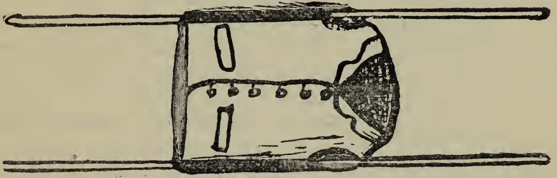


FIG. 37.

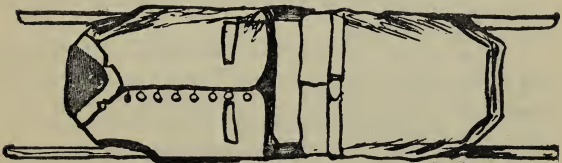


FIG. 38.

Two grain sacks with two poles make an excellent stretcher and in the absence of anything better you may use pillow cases, window shutters or doors. If the last named is used, make it as comfortable as possible with straw or matting.

It is a good rule to always test a stretcher before using it; by so doing you may prevent a disaster on disaster.

Should your patient have a broken leg or thigh. take care that he is not unnecessarily jolted. A little judgment in the arrangement of the stretcher will obviate this.

In the transportation of patients on temporary stretchers, always follow the rules of the stretcher drill, for which see next chapter, the same as if you had a proper stretcher.

Never carry a stretcher on your shoulders.

Always carry a patient feet foremost except when going uphill. But in cases of fracture of the leg or thigh, if he has to be taken down a steep hill, carry him head foremost, keeping him as nearly level as possible.

Whatever obstacles are in your path, go around them, for every time a patient is set down or lifted it gives him that much additional pain.

If the crossing of obstacles is unavoidable, if the intervening fence cannot be torn down, if a breach cannot be made in the brick wall, or the mine cars cannot be gotten out of the way, then obey the following rules:

To Cross a Wall, a "Fall," or a Blockade of Cars.

Lower the stretcher about three feet back from the obstacle. Nos. 1 and 4 (the use of these numbers is explained in our next chapter) grasp the stretcher poles in the middle, one on each side; No. 2 climbs over the obstacle and receives the stretcher as it is passed over to him; Nos. 1 and 4 then climb over and again taking the stretcher poles pass it entirely over the obstacle; No. 3, who has been holding the head of the stretcher all this time, now climbs over, they all resume their former positions and proceed.

Transportation along a narrow passage in mines or a ditch is effected in the same way, Nos. 1 and 4 bestriding the stretcher in a narrow place or descending into a ditch to support the stretcher. If the ditch be deep and wide, the stretcher must be halted and lowered with the handles near the edge; then Nos. 1 and 4 descend and proceed as before.

To Load an Ambulance or Wagon.

Carry the stretcher, with the patient head foremost, to within one yard of the rear of the ambulance and lower the stretcher to the ground; Nos. 1 and 3 take positions at the patient's right and left shoulders respectively; No. 2 facing about and stooping, grasps his handles, and Nos. 1 and 4 the poles on their respective sides. Nos. 1 and 4 open the doors and see that everything is in proper condition and then resume their posts.

At the command LOAD, the bearers lift the stretcher to the height of the ambulance floor and advance, keeping the stretcher level. The legs of the stretcher are placed on the ambulance floor by Nos. 1 and 3, the stretcher pushed in by No. 2, assisted by the others.

Whenever it is possible all the bearers should accompany the ambulance, Nos. 1 and 3 occupying the seats inside, No. 2 inside at the patient's head, and No. 4 standing on the footboard outside.

To Unload an Ambulance.

At the command PREPARE TO UNLOAD, Nos. 1 and

3 open the doors, No. 4 grasps the handles of the stretcher and at the command UNLOAD, draws out the stretcher. assisted by Nos. 1, 3 and 2, who, facing inward, support the poles until the inner handles are reached. The stretcher must be kept level and lowered about a yard from the vehicle. Then No. 4 closes the doors and all take their posts at the stretcher.

Ambulances used by mining companies and in cities where there is an ambulance service, are furnished with what may be termed a rolling bed. This bed consists of a frame made to fit the floor of the ambulance, a set of springs and a mattress covered with green cloth. Mortised into the under side of the frame, so as to rest on an iron track, are a number of small wheels whose action allows the bed to be pushed in or withdrawn with ease.

In loading an ambulance of this kind, the stretcher is brought to within a yard of the ambulance and a little to one side, which allows the bed to be placed on the ground behind the ambulance. Nos. 1 and 4 open the doors of the ambulance, draw out the bed and put it on the ground about three feet back from the ambulance. Nos. 2 and 3 carry the stretcher directly over the bed and, assisted by Nos. 1 and 4, lower the stretcher to the bed. The poles of the stretcher are to be withdrawn if the form of the stretcher will permit it. Nos. 1 and 2 take positions at the head of the patient, one on each side, and at the command LOAD are to raise the bed to the level of the ambulance floor and roll it in.

The ambulance is unloaded by pulling out the bed, Nos. 1 and 2 still at the head and Nos. 3 and 4 at the feet, lowering it to the ground. Having put the poles in position, the bearers take their posts as before and lift the stretcher from the bed.

Accompanying all accidents there is a certain amount of shock, which induces a sensation of cold, so that even at midsummer injured men sometimes shiver with cold. Therefore, it is important that the patient be well covered with blankets or whatever clothing may be handy, whether the season be summer or winter.

All commands should be given in a low tone, but distinct enough to be heard by all the bearers.

It should be the duty of the bearers to keep at a respectful distance the morbidly curious people who are always attracted by accidents, who ask questions, shut out fresh air and do many other things detrimental to the patient.

Time being an essential factor in accidents, the patient should be borne to his home or to a hospital without unnecessary delay. With this end in view, the ambulance driver should drive as fast as the condition of the road and comfort of the patient will permit, exercising special care and driving slower where the road is bad.

It is also important that a physician be notified as early as possible, and equally as important that at the same time he be informed of the nature of the accident. Due attention to this matter may prevent fatal results. If possible, have the doctor at the patient's home waiting for his arrival.

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Chapter XI.

STRETCHER DRILL.

This drill or exercise is not absolutely essential to First Aid work; but as practice makes us perfect in almost any art, the mastery of this drill by First Aid men will make them so much better fitted to deal with accidents.

A soldier may possess as much personal courage before he has mastered the manual of arms and the intricacies of his drill as afterward; but without the drill he will lack that precision, confidence and method that keep a soldier cool, calm and useful under the strain and excitement of a rain of bullets. So it will be with the stretcher bearer. Having learned all the movements and positions of lifting, carrying and lowering a patient on a stretcher, he will do his work without excitement, having become automatic, and he will do it well because he knows how.

This drill is patterned after the United States Army litter drill, with the word "stretcher" substituted for "litter," the former being the more common word.

The drill can be worked by two, three, or four bearers, and with any of the various patterns of stretchers.

As given by Captain J. E. Pilcher, M. D., in the Reference Hand Book, the drill is as follows:

Each Stretcher squad consists of four men.

1. FALL IN. The four men get in line and count off. No. 1 commands the squad and issues the orders. In his

absence No. 4 takes command; if Nos. 1 and 4 are both absent the duty falls on No. 3

2. PROCURE STRETCHER; MARCH. No. 3 steps one pace to the front and, facing in the direction of the stretcher, proceeds thither by the shortest route, takes the stretcher and places it on his right shoulder, canvas down and at a slope of forty-five degrees, the right hand grasping the left pole. He then faces the squad and steps one yard toward the other bearers.

3. ORDER STRETCHER. The stretcher is brought by No. 3 to a vertical position and dropped on the ground, being retained in position by the right hand and arm.

4. CARRY STRETCHER. No. 3 drops the upper handles forward with canvas to the left; No. 2 steps forward and catches the front handles with his left hand; Nos 1 and 4 advance to the middle of the stretcher, to the right and left respectively; Nos. 2 and 3 hold the stretcher between the hand and the hip, grasping the lower handles.

5. GROUND STRETCHER. Nos. 2 and 3 stoop and lower the stretcher to the ground with canvas up.

6. OPEN STRETCHER. Nos. 1 and 4 open the stretcher and arrange the braces; Nos. 2 and 3 arrange the handles at their respective posts. viz., No. 2 at the front and No. 3 at the rear. See Fig 39.

7. LIFT STRETCHER. All the bearers lift the stretcher to carry.

8. TAKE POSTS TO LOAD STRETCHER; MARCH. Nos 1 and 4 let go the stretcher and proceed in double time;

then take positions at the patient's right and left sides respectively, examine the patient and give him First Aid treatment; Nos. 2 and 3 follow with the stretcher.

9. LOWER. Nos. 2 and 3 lower the stretcher one yard from the patient's head and in line with his body.

10. AT PATIENT'S RIGHT (OR LEFT) POSTS. Nos. 2 and 3 take posts at patient's right (or left) ankles and shoulders. They then assist Nos. 1 and 4 in First Aid work. When the patient is ready for the stretcher the next command given is:

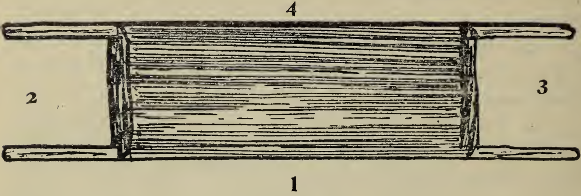

FIG. 39.

11. PREPARE TO LIFT. All bearers kneel on the knee nearest to the patient's feet, right for his right and left for his left; No. 2 passing both his arm under the patient's legs; Nos. 1 and 4 passing their arms under his loins and thighs; No. 3 passing one arm under his shoulders and the other under his neck to the further shoulder, thus supporting the head. (See Fig. 40.) In case of a fracture, the bearer nearest to it supports the part and looks after it.

12. LIFT All lift collectively and raise the patient slowly and gently to the knees of the three bearers who are in line; then the odd bearer, No. 1 or 4, arises and passing by the shortest route to the stretcher, grasps it by the middle, one pole in each hand and places it in front of the bearers and against their ankles.

13. LOWER PATIENT. No. 1 or 4 stoops and assists the other bearers to lower the patient gently to the stretcher and then all resume their respective posts.

14. PREPARE TO LIFT; LIFT. At PREPARE TO LIFT, Nos 2 and 3 stoop, place the slings over their shoulders—if the stretcher has slings—grasp the handles and at the word LIFT they rise and stand erect.

15. MARCH. With the lifted stretcher the bearers march with a short. sliding step of about twenty inches; Nos. 1, 2 and 4 step off with the left foot and No. 3 with his right, forming a "break step."

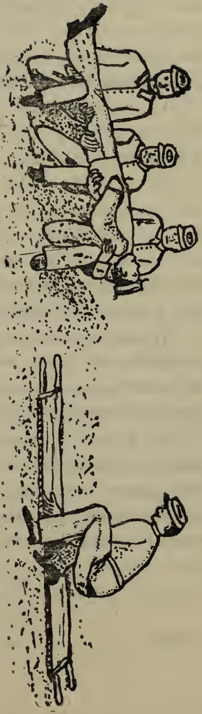

FIG. 40.

16. HALT; LOWER STRETCHER. Nos 2 and 3 lower the stretcher gently to the ground. When lowering or lifting a stretcher, the rear bearer must always watch the front bearer and move simultaneously with him.

Unloading the Stretcher.

17. PREPARE TO LIFT. The bearers, standing at their respective posts, kneel and adjust their hands as in lifting to load the stretcher.

18. LIFT. The bearers lift the patient to their knees and No. 1 removes the stretcher.

19. LOWER. Nos. 2, 3 and 4 lower him to the ground, or, if he is to be put on a bed, or an ambulance bed, they rise from their knees and side step to the bed, the stretcher having been placed one yard away and in line with the bed.

When there are only three bearers, the patient is lifted or lowered to the knees of two, while the third places or removes the stretcher; or he may be carried on a two-handed seat, his legs being supported by the third bearer.

In a case of fractured leg, it is recommended that the bearers kneel on the injured side, raise the patient to their knees, grasp him firmly in a comfortable position, No. 2 supporting his legs and No. 3 his body, the patient clasping No. 3 round the neck while they rise.

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CHAPTER XII.

MINING AND RAILROAD ACCIDENTS.

The causes of accidents in mines are various; falls of coal, ore and rock being the most common; then come explosions of gas and powder; some are incidental to the handling of mine cars, while not a few are inflicted by the heels of festive mules. Nevertheless, the occupation of a miner is not deemed by insurance companies to be as dangerous as that of the railroad brakeman.

A miner's injuries are, as a rule, crushing in their character, the natural result of the falling of heavy weights. The wounds produced are ragged and filled with fine coal or rock. If the force has been great enough to cause a fracture, the bone is often broken into several pieces and the fracture is compound. The flesh, if not cut, is so badly bruised that the vitality is crushed out of it, and after a day or two it sloughs. These injuries are also accompanied by much shock, prolonged by the length of time required to convey the patient from the scene of the accident to his home; for often he works a mile or more underground, and the shaft or drift may also be the same distance from his house. Shock may also be intensified by loss of blood, for although mining injuries, on account of their crushed character, do not bleed much at first, as soon as reaction begins the torn and open blood-vessels bleed profusely, making a striking object lesson in favor of First Aid.

Burns from explosions of gas or powder are not different from other burns, and must be treated in the same manner, the all important idea being to exclude air as soon as possible by an application of some kind of oil. The oil should be poured on the wound and the part bound up with bandages from a First Aid Packet or a clean cloth soaked in oil. Cotton batting may then be applied outside the bandage to keep the part warm; but never put it next the wound, it sticks too tightly and its removal produces torture.

Mangled hands or fingers, and skulls fractured by the hoofs of kicking mules, briefly describes the class of accidents to which driver boys in mines are liable.

It is necessary to remember that a mangled finger or hand should be immediately bound up with a bandage from a First Aid Packet, that is, if you want the doctor to save the finger or hand. Coal dust that may be adhering to a wound is not poisonous; but tobacco and such like applications are decidedly injurious.

Railroad accidents, in their effects, resemble those of the mine, many being the result of heavy weights literally grinding and mangling the parts. They are usually attended with much shock. They happen miles away from the man's home, a doctor or a hospital. Consequently, the patient has to undergo the hardship of being transported a long distance before medical skill can relieve his sufferings. If he has any bones broken his pain is intensified by the swaying and jarring of the car. Probably, too, his wounds are dirty with axle grease, or, to make matters still worse, bleeding may be profuse during all the journey.

How much better such a man's chances will be when some of his fellow railroaders are equipped with First Aid Packets and the training necessary to use them! The bleeding will be promptly stopped, the fractured limb put in splints and the patient made comparatively comfortable.

There ought to be at least one First Aid man in every train's crew, and he equipped with a First Aid Packet and an extra bandage or two.

In railroad yards a large proportion of the employes should be organized into First Aid Associations and a good supply of First Aid Packets kept handy.

Perhaps the ordinary railroad wreck presents a more practical argument in favor of First Aid than any other form of accident. The surviving passengers are usually too excited and nervous to do anything but put themselves in the way. Here, then, the First Aid man with his ever ready appliances would be a veritable Good Samaritan.

Wounds produced by power saws and other sharp tools are of a different order. They always bleed profusely, because the artery or vein is completely severed. But with a little presence of mind and possession of the knowledge imparted in the pages of this book, the spouting blood may be stopped, the wounded member properly bound and danger to life averted.

In foundries and rolling mills a large proportion of the accidents are severe burns by molten or white hot metal. Nearly all such works now keep on hand a supply of "Carron oil," a mixture of equal parts of linseed oil and lime water, which is an excellent application.

Pistol and gunshot wounds bleed very little. Their treatment differs not from the instructions already given for various other injuries.

Wounds caused by exploding dynamite or dynamite caps are usually very severe, sometimes resulting in instant dismemberment. Here, if the First Aid man be prompt to stay the flow of blood, he can probably save a life.

A First Aid man must not presume to take the place of a doctor. His principal duty is to prepare a patient for a doctor and then to insist that one be fetched, no matter how slight the injury.

Home treatment of injuries is often very crude, sometimes absolutely bad, producing blood poisoning and stiff joints.

Thirty years ago a mangled limb was almost invariably amputated as soon as the patient had rallied from the shock; to-day, under the Aseptic (clean) treatment, such limbs are usually saved.

One word more about shock and the giving of whiskey in large quantities to counteract the same. DON'T DO IT. It does more harm than good. It increases hemorrhage; it sickens the stomach, and when a surgical operation is necessary the presence of alcohol in the stomach makes the administration of ether or chloroform a difficult matter. Its bad effects greatly overbalance its good effects; therefore, if given at all, a table-spoonful in water will be sufficient.

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Chapter XIII.

PREPARATIONS FOR ACCIDENTS; DON'TS;

By H. C. Wheeler, M. D.

When an accident happens, stop a moment and think. Then ascertain as nearly as possible the extent of the injury. This will enable you to send an intelligible message to a doctor something like this: John Smith, adult, is hurt; he is conscious; right leg broken; (other hurts, if any, should be mentioned) no bleeding; will have him at his home on ....street at 3:30, p. m.

On receiving such a message the doctor will know exactly what to fetch, where to go and what time to get there.

For the reception of an injured person a large room on the ground floor is better than an upstairs bedroom, and a long table will be found more convenient than a bed. Cover the table with a thick blanket or quilt, and then with a piece of oilcloth and a pillow. Having placed the patient on this, make him as comfortable as possible till the doctor comes.

When it is necessary to remove the clothing, proceed as follows:

To remove the coat, two persons stand one on each side of the patient's shoulders. Each grasps a coat sleeve with one hand and the skirt of the coat with the other. At a given signal, both pull the skirt toward the patient's shoulders and out. Then, if the patient's arms have been raised and kept straight, the sleeves are lifted off and the act is complete.

The vest, shirt and undershirt can be removed in the same manner and just as easily. To remove the trousers draw the upper part of the garment from under the hips, then draw off both legs of the trousers together.

Get ready plenty of clean hot water, towels, soap, a large pail to pour water into, two or three earthen wash bowls and a side table to put them on.

When the doctor comes, all responsibility rests with him; but his wishes should be implicitly obeyed. Only those persons needed to assist the doctor should be allowed in the room.

A Few Don'ts.

When an accident happens:

Don't get excited.

Don't take everybody's advice.

Don't fill the patient with whiskey or brandy.

Don't break your neck because your neighbor has broken his leg.

Don't send for two or three doctors at once. If the patient is conscious, send for the doctor of his choice.

Don't needlessly alarm his family. The messenger sent to his home should be cool and level-headed.

Don't worry the patient with questions.

Don't put cotton batting next a burn.

Don't wash a wound in water that has not been boiled and then allowed to cool.

Don't remove clothing from a patient till he is at home.

Don't stand in the doctor's way, nor instruct him in his work, nor disregard his wishes.

CHAPTER XIV.

HOW TO ORGANIZE FIRST AID ASSOCIATIONS.

A few words, first, to my brother physicians. The aim of this little book is not to make doctors of First Aid men, nor to deprive the surgeon of any patronage. What the trained nurse is to sickness the First Aid man will be to accidents. He will give us a cleaner wound, a less complicated fracture and a stronger patient to treat. He will be a valuable auxiliary to our honorable calling, which is to prevent, relieve or ameliorate human suffering. Viewed from this point, no broad-minded medical man will frown on the movement, nor seek in any way to retard the progress of First Aid associations.

As Brigades of the St. John Ambulance Association, these associations have existed in Great Britain a number of years, and are officered by some of the most prominent men in that country. They flourish, also, through Europe, have had a very successful start in Canada, and have recently made a very creditable record in the South African war. There can be no good reason, then, why they shall not make a record equally as good in this country.

We will suppose that in your vicinity there is a colliery or mine employing 400 men. A good ratio would be one First Aid man to every sixteen workers. This will give you a class of twenty-five men. A much larger class would be unwieldy.

We will suppose, also, that the mine in question has five main headings or gangways. Your men should be so selected as to have five in each of these gangways and they distributed so that at least one may be within easy call in case of an accident anywhere.

The class should consist of men of temperate habits; not too young nor too old; men who will not faint at the sight of blood; intelligent, conscientious men, who will expect no compensation but their own inward satisfaction, supplemented, perhaps, by the gratitude of those whose pains they alleviate.

Such a class, having first organized temporarily, should then elect a President, Vice-President, Secretary, Treasurer and two or more local physicians as Medical Directors and Lecturers.

Money will be required for the purchase of First Aid packets, splints, stretchers, books and other materials. There are several ways by which this can be raised. When the class has been duly organized and the object of the fund made public, there should be but little difficulty in procuring the funds through some or all of the following channels:

1. Every man in the mine should contribute a small sum.

2. The superintendent and other officials of the mine should be asked for a donation. Undoubtedly, they will respond liberally.

3. The various benefit societies in the town should be approached. A dollar contributed by a benefit society may prevent a raid of a hundred dollars on its treasury.

4. The members of the class or association should pay a small entrance fee and monthly dues.

Regular meetings of the association should be held at least twice a month. The times for lectures and practice can be arranged by the medical directors.

Each member should be furnished with a First Aid packet, and the association should always keep a supply in reserve to replace used packets.

When a member has used his packet he should report at the next meeting, giving full particulars of the kind of accident treated and how the packet was used.

A record should be kept by the secretary, giving date and nature of accidents, names of patients, &c.

In different parts of the mine should be kept boxes or cabinets, each containing bandages, boards for splints, a bottle of linseed oil and lime water for burns, a small bottle of aromatic spirit of ammonia, a small glass, a spoon and a folding stretcher.

An excellent case for this purpose has been put on sale by Messrs. Johnson & Johnson.

Wherever possible, induce the mine officials to have some handy building set apart as an Accident Reception room, where all necessary appliances and restoratives may be kept. This applies with equal force to all industries whose operations are above ground, such as foundries, rolling mills, factories, stock yards and railroad yards. The Accident Reception room is especially desirable in factories where a large number of girls are employed, where even a fainting fit sometimes causes an undue amount of excitement. Railroad companies, too, having such a room somewhere in each yard, would find it a remunerative as well as a commendable institution.

In factories and mills it will be an easy matter to have the First Aid men evenly distributed. On railroads each association should be so formed as to have at least two First Aid men in each crew. They should always carry their First Aid packets and reserve supplies in a caboose or baggage car.

It will be the duty of the medical directors to prescribe a course for the class, extending over a period of eighteen months or two years, at the end of which time they may be examined. To the successful ones should be given certificates of efficiency, then some new members taken into the class.

Directors should not examine their own classes. It will be more satisfactory, for obvious reasons, to have the examinations conducted by directors from sister associations

When there are several associations in a town or vicinity, interest may be kept alive by periodical contests, to consist of stretcher drills, tests of skill in bandaging, and carrying patients, &c. In each contest the winner may be given a badge or boutoniere bearing an appropriate design, say a red cross and the name, number and location of the association of which the winner is a member. Such a distinction will, by a conscientious First Aid man, be more highly valued than any other article that gold can buy.

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